

WHAT IS CLAIMED IS:

- 1 1. An integrated circuit (IC) for data communication comprising:
2 circuitry for receiving digital signals from devices within a communication
3 network;
4 circuitry for receiving analog signals from a selected one of said devices;
5 circuitry for routing said analog and digital signals to a digital signal processor
6 (DSP), said DSP outputting processed signals in response to DSP programming
7 commands;
8 circuitry for incorporating particular processed digital signals into data packets
9 corresponding to a communication protocol; and
10 circuitry for receiving and transmitting said data packets of a communication
11 protocol to and from a network coupling said physical layer devices.
- 1 2. The IC of claim 1 further comprising circuitry for outputting analog signals
2 derived from particular ones of said processed signals from said DSP to a particular one
3 of said physical layer devices.
- 1 3. The IC of claim 1, wherein said DSP receives digital data not derived from a
2 corresponding analog signal.
- 1 4. The IC of claim 1, wherein selected first digital data from said DSP are analyzed
2 by a network processor to determine a characteristic of said first digital data, said
3 characteristic used in said network processor to direct a dispensation of said first digital
4 data.

- 1 5. The IC of claim 4, wherein said processing to determine said characteristic of said
2 first digital data comprises a pattern recognition algorithm.

1 6. A network processor comprising:
2 an embedded processor complex (EPC) with multiple processors;
3 a first communication interface to physical layer devices;
4 a second interface to a switch fabric;
5 a memory storage unit;
6 a digital signal processor (DSP) having an analog I/O and a digital I/O interface;
7 and
8 a bus system for coupling said EPC, said physical layer devices, said switch
9 fabric, said storage unit and said DSP.

1 7. The network processor of claim 6, wherein said DSP is one of said multiple
2 processors in said EPC.

1 8. The network processor of claim 6, wherein said DSP is a functional core
2 integrated into each one of multiple processors in said EPC.

1 9. The network processor of claim 6, wherein said DSP is a functional core external
2 to said EPC, said DSP coupled to said EPC and to one of said physical layer devices.

1 10. The network processor of claim 6, wherein said DSP has an analog signal
2 interface for receiving and sending analog signals and a digital signal interface for
3 sending and receiving digital signals.

1 11. The network processor of claim 6, wherein said DSP receives program commands
2 via said switch fabric from a remote device.

- 1 12. The network processor of claim 6, wherein said DSP receives program commands
2 via a general purpose processor in said network processor.

1 13. A method for improving the performance and functionality of a network
2 processor controlling the communication between physical layer devices comprising the
3 steps of:

4 adding a DSP core to said network processor;
5 coupling digital signals to and from said network processor and said DSP;
6 executing instructions by said DSP to determine a characteristic of said digital
7 signals; and
8 directing a dispensation of said digital signals based on said determined
9 characteristic.

1 14. The method of claim 13 further comprising the steps of:

2 coupling analog signals to said DSP;
3 digitizing said analog signals;
4 processing said digitized analog signals by said DSP;
5 incorporating said processed digital signals into data packets corresponding to a
6 communication protocol; and
7 receiving and transmitting said data packets of said processed digital signals to
8 said physical layer devices on a communication network coupled to said network
9 processor.

1 15. The method of claim 14 further comprising the step of:

2 outputting analog signals converted from said processed digital signals to a
3 particular physical layer device.

1 16. The method of claim 13, wherein said DSP is one of multiple processors in an
2 embedded processor complex in said network processor.

1 17. The method of claim 13, wherein said DSP is a functional core integrated into
2 one of multiple processors in a embedded processor complex in said network processor.

1 18. The method of claim 13, wherein said DSP is a functional core coupled to an
2 embedded processor complex in said network processor one of said physical layer
3 devices.

1 19. The method of claim 13, wherein said DSP has an analog signal interface for
2 receiving and sending analog signals and a digital signal interface for sending and
3 receiving digital signals.

1 20. The method of claim 13, wherein said DSP receives program commands via a
2 switch fabric coupled to said network processor from a remote device.

1 21. The method of claim 13, wherein said DSP receives program commands via a
2 general purpose processor in said network processor.